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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,576	07/28/2003	John LeRoy Parker JR.	8245.057	5022

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EXAMINER	
LAM, CATHY FONG FONG	
ART UNIT	**PAPER NUMBER**
1794	

MAIL DATE	DELIVERY MODE
12/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/632,576	PARKER ET AL.	
	Examiner	Art Unit	
	Cathy Lam	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *46-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *46-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 September 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

In view of the amendment and remarks filed on September 21, 2007, the 112 rejection has been withdrawn. However the pending claims continue to be unpatentable as following:

Drawings

1. The drawings were received on September 21, 2007. These drawings are acceptable.

Claim Rejections - 35 USC § 112

2. Claims 46-62 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly added limitation, i.e. "unplated blind via" is not clearly supported in the disclosure.

3. Claims 50 and 53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 50, in the second phrase "said first conductive material" lacks antecedent basis.

In claim 53, the last phrase is structurally indefinite, clarification is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 46-47 & 53-54, 57-58 and 60-61 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hagner (US 4604678).

Hagner teaches a circuit board comprised of an insulating substrate and a plurality of grooves.

The grooves are extending into and below the upper surface (but not through) of the insulating substrate (col 2 L 18-23). The examiner is taking the position that this is a blind trench that meets the present invention.

An electrically conductive material is filled into the grooves before conductive pads (20) are connected thereof (col 5 L 59-64 & Fig. 3).

Hagner has not mention of plating or pretreating the groove surface before filling with an electrically conductive material. The examiner is taking the position that Hagner clearly meets the unplated blind via.

Claim Rejections - 35 USC § 102/103

6. Claims 46-62 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dubin (US 6077780).

Dubin discloses an integrated circuit comprised of conductive via holes and conductive trenches.

Regarding to claims 46, 53 and their dependents, Dubin discloses that the conventional trenches (12) were formed in an insulating layer (14) and via hole (20) were formed in an interlevel insulating layer (28) (Figs 1A, 1B & 2).

The trenches (12) and via holes (20) were filled with copper material to form conductive lines and conductive via holes (col 1 L 23-34). The copper material was filled into the trenches (12) and via holes (20) without any surface treatment or plating to the trench's wall or via hole's wall beforehand.

The examiner is taking the position that the trenches (12) resemble the claimed blind via hole.

Dubin's invention was directed to treating a blind via hole or a trench opening (552) formed within an insulating layer (554).

The trench opening (552) is treated with a barrier layer (556), a wetting layer (558) and a copper seed layer (560), respectively, before filling the trench opening (col 3 L 36-67). These three layers resemble the claimed first conductive layer as in claims 50-52.

The trench remains to have an opening (552) after treated with these three layers. Then, copper material (652) is filled into the trench opening (Fig. 8B). Excess copper and metal layers were removed to show only the trench or via field regions. From the Figures, one can see that the copper material is in the of a paste or an ink.

A conductive pad is then formed over the trench surface and in electrical contact with the copper line in the trench (col 4 L 55-65 & Fig. 9B).

Dubin teaches the present invention but is silent about the thicknesses of the plating layers. In view of the prior art teaching, one skill in the art would find a workable thickness for the plating layer because such finding involves only routine experimentations.

7. Claims 50-52, 61-62 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ishikawa et al (US 5243142).

Ishikawa discloses a printed wiring board comprised of an insulating substrate (1), a via hole (3), a first plating layer (4), a second plating layer (6) and a non-electroconductive resin paste (5).

The via hole if formed in the insulating substrate and is plated with the first plating layer (4). The first plating layer (4) is a copper layer that plates over the both surfaces and the via hole surface of the insulating substrate (col 2 L 30-34).

A non-electroconductive resin paste (5) that containing a metal powder is used to filled into the plated via hole. Then a second plating layer (6) which is also a copper layer is plated over both surfaces of the insulating substrate and completely covers the first plating layer (4) and the resin paste (5) (col 3 L 52-55). The first and second plating layers (4 & 6) would be formed into a circuit pattern (col 5 L 49-53, Fig. 4).

The prior art teaches the present invention except for the resin paste in the via hole is non-electroconductive. The prior art also does not teach the thickness of the Cu plating layer being < 0.2 mil.

Ishikawa teaches the non-electroconductive resin paste that containing metal powder, the amount of metal powder is a controlled amount, so that it would not to increase electroconductivity (col 2 L 60-65).

In view of Ishikawa's teaching, one skill in the art would choose an electroconductivity for the via hole resin paste by adjusting the amount of metal powder because it is just a matter of design choice. Furthermore, one skill in the art would certainly choose a desirable thickness for the conductive pads or wiring patterns because it is only a matter of design choice.

Ishikawa's second plating layer (6) is plated over the first plating layer and seals off both ends of the via hole resin paste; the examiner is taking the position that Ishikawa's structure is both a buried via and a through hole blind via.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cathy Lam
Primary Examiner
Art Unit 1794

cfl
December 07, 2007